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ABSTRACT

This study is an attempt to obtain a national assessment that could help inform federal policy. The study looks at all the states in order to obtain an assessment on a consistent basis, is based solely on results of reform--disparities in the distribution of education funds, and examines not only the state's status in a recent time period but also the extent to which that status constitutes progress. Section 2 analyzes overall disparities in each state. Section 3 analyzes the distribution of education funds among districts that vary in local wealth and among districts that vary in urban status. Section 4 discusses the role of state aid as an equalizing factor and examines changes in the spending levels in the states. Section 5 estimates the costs of future equalization and presents a method for using equalization costs as an indicator of disparity. Section 6 employs the results of the preceding sections to focus on status and changes in reform states. The final section summarizes the findings for the reform states and for the nation as a whole. (Author/IRT)

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The Effects of School Finance Reform

Changes from 1970 To 1975

A Report Submitted to

Office of the Assistant Secretary for Planning and Evaluation
U.S. Department of Health, Education, and Welfare

Through
General Research Corporation

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Richard A. Rosthal

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PREFACE

The work reported here was conducted through a subcontract from General Research Corporation, under a prime contract from the Department of Health, Education, and Welfare. Dr. Harrison N. Hoppes was the responsible official for General Research Corporation.

The authors wish to express their appreciation of the thoughtful guidance throughout the study of Dr. Alan S. Ginsburg, who served as Project Officer for the Office of the Assistant Secretary for Planning and Evaluation. Ms. Esther O. Tron of the Office of Education provided helpful comments on a draft of the report. The authors are solely responsible, however, for the accuracy of the results and for views and opinions expressed here.

Thanks are also due to staff members of Killalea Associates: Dr. Bruce Loatman, for technical review; Dr. Mary DeLapp for assistance in programming and validating the results; and Ms. Anne Greco for her patience in typing and retyping the report.

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I. INTRODUCTION

Almost every state constitution makes education a responsibility of the state as a whole, although in practice much of the responsibility is delegated to local school districts. The district is presumed, by virtue of its proximity to the point at which services are delivered, to be in the best position to make decisions on the form of education appropriate to the needs and preferences of its community. But its decisions are constrained by the level of resources that the community can make available for education. That level is determined, to a significant extent, by taxation on local property wealth; and property wealth is distributed nonuniformly throughout a state. Several state courts have ruled that substantial disparities in educational resources, traceable to varying levels of property wealth, violate their constitutions by failing to provide educational opportunity to all children on an equal basis.

The states have reacted to this concern for equity in a number of ways. Some 20 states have legislated changes to their school finance programs -- in some instances by modifying the basic form of their system, and in others by assuming a greater share of the education funding burden. Many of the other 30 states have expressed their concern as well, most often by commissioning studies. As a result, the literature now abounds with studies in school finance, and yet it is difficult to discern, nationally, the extent of the problem or the effect of reform where it has occurred.

This study is an attempt to obtain a national assessment that could help inform federal policy, and accordingly it differs from prior studies in several ways. Most studies have been concerned with one or a few states but they naturally employ different criteria and methodology. The present study looks at all the states in order to obtain an assessment on a consistent basis; this also makes it possible to contrast reform with nonreform states. Second, many studies have been concerned with the form of an equalization plan -- that is, with the mechanisms a state uses to control the flow of funds or the imposition of taxes. Such studies provide information that is important in designing a state program, but they do not necessarily shed light on its anticipated effects. The present assessment is based solely on results -- disparities in the distribution of education funds. Finally, this study examines not only the status in a recent time period but also the extent to which that status constitutes progress. If the situation has improved, it may not be unreasonable to assume that it will continue to do so, and there may be little need for federal intervention. If there has been little change and if there are severe problems at present, there may be need for stronger remedial action.

Each section includes a description of the methods used for its particular analyses. Several matters are common to the study as a whole:

. Data bases. For a study of this kind it would be ideal to have data in consistent form and definition for each of a number of years including the most recent. The real world never makes such data available, but this study uses two data bases, for 1970 and 1975, that contain generally adequate and comparable data.[1] The movement to reform state

school finance programs did not get under way until after 1970, and its initial impacts could be expected to have registered by 1975.

. The unit of observation. The unit of observation in this study is the individual child. The data are, however, available at the level of the district as a whole. All district figures are therefore weighted by enrollment.[2] This approach assumes, in effect, that the allocation of resources within each district is equitable, an assumption that is open to question but that cannot readily be investigated with current data bases.

. Treatment of non-unified districts. Most states operate unified school districts -- that is, those that serve both elementary and secondary grades. Several states operate districts that serve only elementary grades and districts that serve only secondary grades. There are often substantial differences in expenditures per pupil between these two types of non-unified districts. In the calculations presented here, no distinction is made between the two types. Although this approach is equivalent to assuming that differences in expenditure levels are discriminatory (rather than justified by different requirements at the two grade groups), test calculations indicate that the results of the study are not affected. Appendix A describes the test calculations.

. The measure of educational resources. This study employs current operating expenditures (COE) per pupil as a measure of educational resources. It is comprehensive; it excludes capital outlays, which could otherwise make resources appear to be very high in the year of outlay; and it is readily available in national data bases. To be an effective measure of resources, however, COE should be adjusted for the varying costs of education throughout a state; techniques are now under study for identifying and adjusting for varying costs, but it has not been possible to apply them in the present study.[3] The lack of a cost adjustment can affect the interpretation of "status results" but has little effect on estimates of changes over time; that is, a change in resources, however resources are measured, should provide meaningful information.

. Exclusion of federal revenue. Current operating expenditures are made from revenues collected from several sources, including the federal government. Since the purpose of the present study is to assess the adequacy of the core programs within the states, it is not appropriate to include such federal revenue. The exception is federal impact aid, which can properly be considered as local revenue on the rationale that it is intended to replace local revenue that would be available if federal property were not located in or near the school district. Accordingly, the measure of resources used here is current operating expenditures of a district multiplied by the ratio of (1) local and state revenues plus impact aid to (2) total revenues.

Section II analyzes overall disparities in each state. Section III analyzes the distribution of education funds among districts that vary in local wealth and among districts that vary in urban status. Section IV discusses the role of state aid as an equalizing factor and examines

changes in the spending levels in the states. Section V estimates the costs of future equalization and presents a method for using equalization costs as an indicator of disparity. Section VI employs the results of the preceding sections to focus on status and changes in reform states. The final section summarizes the findings for the reform states and for the nation as a whole.

II. OVERALL DISPARITY

The beginning point in the examination of within-state equity is overall disparity — the extent of the difference in per-pupil expenditures across the districts in a state, without reference to the incidence or causes of the disparity. The discussion begins with a description of the measures used.

Measures of Disparity

There is no agreement on an appropriate measure of disparity, and it is generally thought that the perceived extent of disparity differs perhaps greatly, across the measures. Three statistical measures commonly used by analysts were applied to the data bases used in this study for 1970 and 1975: the coefficient of deviation, the coefficient of variation, and the so-called Gini index. As Appendix B shows, the correlations between each pair of statistical measures range from .95 to .98, which means that, for all intents and purposes, these measures are identical in their results. Of these measures, we have selected one for presentation in this section:

- Coefficient of Variation. The standard deviation expressed as a percent of the mean. A value of, say, 12.4 means that approximately one sixth of the students in the state receive at least 12.4 percent more expenditures than the state average and one sixth receive at least 12.4 percent less than the average.

Another type of measure that has been used in many studies in the past is one that calculates the ratio of expenditures at two points in the distribution. One of these is also displayed here:

- 95:5 Percentile. The ratio of expenditures at the 95th percentile of students to expenditures at the 5th percentile. A value of, say, 1.8 means that students at the 95th percentile receive 1.8 times the expenditures of those at the 5th percentile.

The 95:5 measure has the advantage of simplicity, but it can be criticized on several grounds. The exclusion of the highest and lowest five percent of the students is intended to account for circumstances that might justify some extreme unevenness in the distribution. But when applied to all states, it in effect assumes that unusual circumstances arise uniformly in all the states, which is not the case. Moreover, there is considerably less justification for excepting the children at the low end of the spending spectrum than for excepting those at the high-spending end. A cost-of-education index, if it were available, would assist in identifying such circumstances as they arise in individual states; in the absence of such an index, the 95:5 measure is applied in the same way to all states. The measure is used here primarily because it is widely used and in particular because it is embedded in a federal regulation.

In reviewing the results in this section, the reader might wish to give somewhat greater weight to the results calculated by the coefficient of variation than to those produced by the 95:5 measure. Surprisingly, however, there is less need for this caution than might be expected; despite its obvious structural flaws, the 95:5 measure is highly correlated with each of the statistical measures, with correlations ranging from .83 to .89.

Change according to either measure is calculated as the difference between the 1975 and 1970 values expressed as a percent of the 1970 value.

Results

Table I presents the disparity calculations. States are listed in order of decreasing disparity (by the 95:5 measure) in 1970. Columns 1, 2, and 3 show the results for the 95:5 measure: the 1970 disparity, the 1975 disparity, and the change as a percent of 1970. Columns 4, 5, and 6 show similar data for the coefficient of variation. As expected based on the findings presented in Appendix B, the disparities according to the two measures are broadly in agreement (correlation of .85). The changes in the five-year period are also in close agreement, except for Alaska (which is an outlier in both the geographic and the statistical senses), Connecticut, Delaware, and South Carolina.

The states with the greatest disparities in 1970 were in all regions of the country, although more of them are along the Eastern seaboard than from any other area. At the opposite end of the ranking, the states with the least disparity tended to be those with the smallest populations (the only exception being Florida), and tended also to be in the West. It can also be noted that the six states with the least disparity also operate relatively few school districts.[4] Of the states in which disparities decreased in the five-year period, many of them were those in which disparities were greatest in 1970.

Table II provides another way of viewing the same results, by ranking the states by decreasing disparity in 1975. In 1970, four states had 95:5 disparities of 2.0 or more; there were four such states in 1975 also, but only Connecticut remained at this level over the period. In 1970, ten states showed 95:5 disparity ratios of less than 1.5; there were also ten such states in 1975, but most of them had been low-disparity states in 1970. Attention should therefore be directed to the states with disparities of 1.5 or more. Among these states, disparities were increasing in some and decreasing in others, but the overall result appears to have been very little progress and possibly a retrogression.

A count of the states at various levels of disparity is not an adequate way to assess the status in the nation as a whole. We also care about how many children are in states with high levels or low levels of disparity. That is to say, we should be concerned about disparities wherever they occur, but we would be concerned even more if a large number of children are in the states with the greatest disparities. In

Table I. Within-State Disparities, 1970 and 1975
(Ranked by 95:5 Measure in 1970)

	95:5 Percentile			Coefficient of Variation		
	1970 (1)	1975 (2)	Change* (3)	1970 (4)	1975 (5)	Change* (6)
Vermont	3.36	1.99	-41	0.38	0.21	-45
Connecticut	2.22	2.29	3	0.23	0.21	- 9
Delaware	2.06	1.70	-17	0.16	0.18	13
Illinois	2.05	1.90	- 7	0.23	0.22	- 4
Arkansas	1.96	1.78	- 9	0.18	0.18	0
North Dakota	1.95	1.53	-22	0.17	0.14	-18
Massachusetts	1.94	2.17	12	0.19	0.23	21
New Jersey	1.93	1.95	1	0.20	0.20	0
Tennessee	1.91	1.90	- 1	0.23	0.21	- 9
Texas	1.91	1.79	- 6	0.23	0.20	-13
Montana	1.91	1.97	3	0.19	0.21	11
New Hampshire	1.88	1.78	- 5	0.17	0.16	- 6
Arizona	1.88	1.71	- 9	0.21	0.17	-19
California	1.86	2.02	9	0.21	0.21	0
Georgia	1.86	2.41	30	0.20	0.28	40
Kansas	1.86	1.65	-11	0.22	0.14	-36
Missouri	1.84	1.73	- 6	0.25	0.24	- 4
Iowa	1.82	1.34	-26	0.18	0.09	-50
Michigan	1.81	1.71	- 6	0.19	0.17	-11
Ohio	1.78	1.78	0	0.19	0.20	5
Colorado	1.76	1.77	1	0.16	0.18	13
Rhode Island	1.75	1.58	-10	0.19	0.13	-32
Kentucky	1.72	1.86	8	0.17	0.20	18
South Dakota	1.71	1.50	-12	0.18	0.13	-28
Mississippi	1.71	1.80	5	0.17	0.17	0
Oklahoma	1.67	1.51	-10	0.20	0.20	0
Washington	1.66	1.83	10	0.17	0.18	6
South Carolina	1.66	1.65	- 1	0.13	0.14	8
Virginia	1.66	1.78	7	0.22	0.27	23
New York	1.64	1.85	13	0.16	0.23	44
Nebraska	1.63	1.73	6	0.15	0.19	27
Wisconsin	1.60	1.59	- 1	0.16	0.16	0
Maryland	1.60	1.77	11	0.14	0.20	43
Indiana	1.59	1.50	- 6	0.14	0.13	- 7
Pennsylvania	1.57	1.57	0	0.16	0.17	6
Wyoming	1.57	1.82	16	0.17	0.21	24
Maine	1.57	1.67	6	0.16	0.16	0
Florida	1.53	1.30	-15	0.13	0.09	-31
New Mexico	1.51	1.41	- 7	0.14	0.13	- 7
Oregon	1.50	1.50	0	0.12	0.14	17
West Virginia	1.49	1.49	0	0.14	0.13	- 7
Idaho	1.49	1.51	1	0.12	0.16	33
North Carolina	1.49	1.51	1	0.12	0.12	0
Minnesota	1.46	1.62	11	0.13	0.15	15
Alabama	1.43	1.43	0	0.12	0.12	0
Louisiana	1.33	1.32	- 1	0.09	0.10	11
Alaska	1.30	1.29	- 1	0.08	0.16	100
Utah	1.27	1.27	0	0.09	0.09	0
Nevada	1.19	1.18	- 1	0.08	0.07	-13
Hawaii	1.00	1.00	0	0.00	0.00	0

*(1975 - 1970) ÷ 1970

Table II. Within-State Disparities, 1975
(Ranked by 95:5 Measure)

	95:5 Percentile		Coefficient of Variation	
	1975 (1)	Change* (2)	1975 (3)	Change* (4)
Georgia	2.41	30	0.28	40
Connecticut	2.29	3	0.21	- 9
Massachusetts	2.17	12	0.23	21
California	2.02	9	0.21	0
Vermont	1.99	-41	0.21	-45
Montana	1.97	3	0.21	11
New Jersey	1.95	1	0.20	0
Illinois	1.90	- 7	0.22	- 4
Tennessee	1.90	- 1	0.21	- 9
Kentucky	1.86	8	0.20	18
New York	1.85	13	0.23	44
Washington	1.83	10	0.18	6
Wyoming	1.82	16	0.21	24
Mississippi	1.80	5	0.17	0
Texas	1.79	- 6	0.20	-13
Arkansas	1.78	- 9	0.18	0
New Hampshire	1.78	- 5	0.16	- 6
Ohio	1.78	0	0.20	5
Virginia	1.78	7	0.27	23
Colorado	1.77	1	0.18	13
Maryland	1.77	11	0.20	43
Missouri	1.73	- 6	0.24	- 4
Nebraska	1.73	6	0.19	27
Arizona	1.71	- 9	0.17	-19
Michigan	1.71	- 5	0.17	-11
Delaware	1.70	-17	0.18	13
Maine	1.67	6	0.16	0
Kansas	1.65	-11	0.14	-36
South Carolina	1.65	- 1	0.14	8
Minnesota	1.62	11	0.15	15
Wisconsin	1.59	- 1	0.16	0
Rhode Island	1.58	-10	0.13	-32
Pennsylvania	1.57	0	0.17	6
North Dakota	1.53	-22	0.14	-18
Idaho	1.51	1	0.16	33
North Carolina	1.51	1	0.12	0
Oklahoma	1.51	-10	0.20	0
Indiana	1.50	- 6	0.13	- 7
Oregon	1.50	0	0.14	17
South Dakota	1.50	-12	0.13	-28
West Virginia	1.49	0	0.13	- 7
Alabama	1.43	0	0.12	0
New Mexico	1.41	- 7	0.13	- 7
Iowa	1.34	-26	0.09	-50
Louisiana	1.32	- 1	0.10	11
Florida	1.30	-15	0.09	-31
Alaska	1.29	- 1	0.16	100
Utah	1.27	0	0.09	0
Nevada	1.18	- 1	0.07	-13
Hawaii	1.00	0	0.00	0

*(1975 - 1970) ÷ 1970

1970 the state average disparity ratio was 1.72; the average in 1975 was 1.67, which would appear to indicate that there has been a slight reduction in disparities nationwide. When each state's disparity ratio is weighted by its enrollment, however, we come to a different conclusion. The weighted average disparity in 1970 was 1.74, which indicates that disparities were somewhat greater in the larger states; and the weighted average disparity in 1975 was 1.75, which indicates that disparities have not decreased and, if anything, have increased.

Thus far, the study has described disparities in the states without addressing the question, How much disparity is too much? One source of guidance is a criterion set by the Office of Education in determining qualifications for a state to be able to count federal impact aid as state aid.[5] The state must be operating an effective school finance system, where effectiveness is determined by whether or not its disparity, as measured by the 95:5 test, is no greater than 25 percent. According to our results, only two states, Hawaii and Nevada, could meet this requirement in 1975. The Office of Education test excludes from the disparity test the spending a state makes for special needs, while the present study has not separately identified such funds. Nonetheless, it is difficult to believe that more precise measurements would result in more than a handful of states qualifying in 1975.

III. THE INCIDENCE OF DISPARITIES: GAINERS AND LOSERS

The analysis in the preceding section portrays the extent to which overall disparities are being reduced. This is of course not the only criterion on which to judge the equity of a particular school finance arrangement. The principal fault found by state courts is that the level of per-pupil resources depends on the ability of localities to raise revenues to support education; we therefore want to examine the incidence of disparities in places that vary in local wealth per pupil. A second issue arises in connection with the cities. Many have argued that redistribution of educational resources to eliminate the effects of property wealth would harm the cities, because these areas generally have high property wealth. The second analysis therefore examines the resources available in cities relative to other places. Both analyses examine the status in 1975 and the change from 1970.

Disparities and Local Wealth

The first step in analyzing the relation between expenditure disparities and local wealth is to decide on a measure of wealth or ability to pay. Assessed property valuation, equalized within a state, is the most commonly used measure. It has been criticized on several grounds, among them that, since property taxes are paid out of available income, the level of income in a community should be incorporated into any measure of ability to pay. One difficulty is that income data are usually available for entities much larger than school districts, and they are actually aggregated over many different income levels in the area. Another argument is that the measure of local ability to pay should incorporate only those objects on which a community can in fact levy taxes, and generally communities cannot levy taxes on income. This is not a matter to be resolved in this study, which for convenience uses the traditional measure of equalized property valuation (EPV) per pupil.

We divide each state's student population into three groups: the 25 percent of the students attending school in districts with the lowest property valuation per pupil, the 25 percent in districts with the highest property valuation, and the middle 50 percent. For each of these groups we calculate the level of resources relative to the state average.[6]

Table III shows the relation between expenditures and property wealth for each of the three groups. Entries in the table can be understood by reference to Arizona: the 25 percent of the children in districts having the lowest property valuation per pupil (EPV/PUP) received 81 percent of the state's average in 1970; in 1975 their expenditures were 95 percent of the average, constituting a positive change of 17 percent. Data for this analysis are not available for Alaska and Hawaii; data for 1970 are not available for Alabama and Louisiana. Results for Montana and Vermont are unduly influenced by the sample and are regarded as not reliable; the results for these states are presented here but are omitted from any later discussions of wealth-related disparities. For other states, however, the results are believed to be a valid approximation to the actual situation.

Table III. Expenditures, 1975, and Changes in Expenditures 1970 to 1975, in Districts of Varying Per-Pupil Property Valuation (Expenditures Relative to State Average)[a]

	Low 25% EPV/PUP			Mid 50% EPV/PUP			High 25% EPV/PUP		
	1970	1975	Change[b]	1970	1975	Change[b]	1970	1975	Change[b]
Alabama	*	0.95	*	*	1.01	*	*	1.02	*
Arizona	0.81	0.95	17	1.02	0.95	- 7	1.16	1.15	- 1
Arkansas	0.84	0.90	7	0.99	0.97	- 2	1.18	1.17	- 1
California	0.87	0.88	1	0.96	0.98	2	1.21	1.15	- 5
Colorado	0.84	0.86	2	0.98	0.94	- 4	1.20	1.26	5
Connecticut	0.82	0.90	10	1.00	1.04	4	1.18	1.02	-14
Delaware	0.87	0.89	2	0.99	1.03	4	1.16	1.05	- 9
Florida	0.87	0.92	6	1.00	1.01	1	1.14	1.07	- 6
Georgia	0.86	0.83	- 3	0.93	0.95	2	1.27	1.27	0
Idaho	0.92	0.94	2	1.02	0.99	- 3	1.05	1.07	2
Illinois	0.82	0.87	6	1.01	1.04	3	1.15	1.06	- 8
Indiana	0.89	0.90	1	1.03	1.00	- 3	1.05	1.10	5
Iowa	1.01	0.95	- 6	0.99	1.00	1	1.02	1.04	2
Kansas	0.88	0.91	3	0.94	0.97	3	1.25	1.16	- 7
Kentucky	0.83	0.82	- 1	1.00	0.98	- 2	1.17	1.22	4
Louisiana	*	0.96	*	*	1.01	*	*	1.03	*
Maine	0.90	0.93	3	1.00	1.00	0	1.10	1.07	- 3
Maryland	0.93	0.82	-12	0.95	0.97	2	1.17	1.23	5
Massachusetts	0.88	0.88	0	1.00	1.03	3	1.12	1.05	- 6
Michigan	0.86	0.90	5	0.97	0.99	2	1.19	1.13	- 5
Minnesota	0.93	0.90	- 3	1.02	0.99	- 3	1.04	1.13	9
Mississippi	0.86	0.93	8	0.95	0.95	0	1.23	1.17	- 5
Missouri	0.83	0.86	4	0.98	1.00	2	1.21	1.13	- 7
Montana	0.83	0.95	14	0.95	1.05	11	1.27	0.95	-25
Nebraska	0.92	0.90	- 2	0.99	0.97	- 2	1.10	1.15	5
Nevada	1.05	0.99	- 6	0.95	0.98	3	1.04	1.04	0
N. Hampshire	0.98	0.91	- 7	0.98	1.02	4	1.06	1.04	- 2
New Jersey	0.87	0.92	6	0.99	0.99	0	1.14	1.10	- 4
New Mexico	0.88	1.01	15	0.99	0.97	- 2	1.14	1.04	- 9
New York	0.88	0.78	-11	1.01	0.99	- 2	1.10	1.24	13
N. Carolina	0.95	0.93	- 2	1.03	0.97	- 6	0.98	1.12	14
N. Dakota	0.83	0.97	17	1.04	0.98	- 6	1.08	1.06	- 2
Ohio	0.81	0.83	2	0.98	1.00	2	1.23	1.16	- 6
Oklahoma	0.83	0.91	10	0.96	0.97	1	1.24	1.15	- 7
Oregon	0.94	0.91	- 3	1.03	1.00	- 3	0.99	1.08	9
Pennsylvania	0.88	0.87	- 1	0.97	1.00	3	1.17	1.14	- 3
R. Island	0.89	0.92	3	0.97	0.99	2	1.18	1.11	- 6
S. Carolina	0.87	0.90	3	1.00	1.02	2	1.13	1.05	- 7
S. Dakota	0.89	0.92	3	1.05	0.99	- 6	1.01	1.09	8
Tennessee	0.83	0.85	2	1.10	0.97	-12	0.96	1.20	25
Texas	0.83	0.85	2	0.98	1.00	2	1.21	1.15	- 5
Utah	0.93	0.95	2	1.01	1.00	- 1	1.05	1.05	0
Vermont	0.87	0.92	6	0.93	1.07	15	1.27	0.93	-27
Virginia	0.85	0.87	2	0.95	0.91	- 4	1.25	1.31	5
Washington	0.88	0.92	5	1.01	0.97	- 4	1.10	1.13	3
W. Virginia	0.94	0.91	- 3	0.94	0.97	3	1.17	1.14	- 3
Wisconsin	0.94	0.93	- 1	0.97	1.01	4	1.12	1.04	- 7
Wyoming	0.85	0.95	12	0.96	0.94	- 2	1.22	1.17	- 4

[a]Data not available for Alaska and Hawaii.

[b]Change is (1975-1970) ÷ 1970.

*Data not available.

The table confirms the well-known association between resources and local wealth. In every state except New Mexico, children in low-wealth districts received less than the state average in both years. In general, the middle 50 percent of the children received about the state average, and the children in high-wealth districts received more -- sometimes much more, as in Colorado, Georgia, Kentucky, Maryland, New York, Tennessee, and Virginia, where at least 20 percent more than the state average was available to them.

The third column under each EPV grouping reflects the change (the difference in expenditures as a percent of the 1970 expenditures). Of the 44 states for which change is calculated (and omitting Montana and Vermont), low-wealth children showed positive change in 29, stayed the same in 1, and showed negative change in 14. Many of the positive changes were in less populous states, however, and a number of the larger states showed negative changes. Only in 10 states were low-wealth children receiving at least 95 percent of the state average expenditures in 1975, and none of the 10 was a populous state. The low-wealth children lost ground most sharply in Maryland and New York.

Where low-wealth children gained, it was most often at the expense of high-wealth children, as would be expected. This is seen particularly in New Mexico, where low-wealth children gained by 15 percent while high-wealth children lost by 9 percent -- the end result in 1975 being that both groups were at approximately the same level. Somewhat the same patterns of change can be seen in Connecticut, Delaware, Rhode Island, South Carolina, and Wyoming, although in none of these states was the change sufficient to overcome the disadvantage for low-wealth children.

It should be noted at this point that the disparities presented in Table III would generally appear much higher if our measure of resources did not include federal impact aid. That is, that federal program is targeted on places with heavy federal presence, and these are generally (in most states) places with low property valuation. Removing impact aid from the measure of resources removes little from high-wealth districts and much from low-wealth districts, thus increasing the wealth-related disparities. There are, however, eight states in which the high-wealth districts receive much more impact aid than the low-wealth districts; in these states the removal of impact aid from the resource measure would decrease perceived disparities related to local wealth. Appendix C shows the distribution of impact aid by low, middle, and high wealth districts.

It is difficult to obtain a ready assessment of disparity related to local wealth by scanning the expenditure levels in three groups. Table IV, based on the same data, is intended to help improve our perceptions. The first column is an index of wealth-related disparities in 1970, calculated by dividing expenditures in the high-wealth quartile by expenditures in the low-wealth quartile. The second column shows a similar calculation for 1975. The third column shows the change, defined as the difference in the two values divided by the 1970 value. The results can be interpreted by reference to the first entry: In 1970, Ohio's high-wealth quartile received 1.52 times the expenditure level received by

Table IV. Wealth-Related Expenditure Disparities, 1970 and 1975[a]

	Wealth-Related Expenditure Disparity[b]		Change As a % of 1970
	1970	1975	
Ohio	1.52	1.40	- 8
Oklahoma	1.49	1.26	-15
Georgia	1.48	1.53	3
Virginia	1.47	1.51	3
Missouri	1.46	1.31	-10
Texas	1.46	1.35	- 8
Connecticut	1.44	1.13	-22
Wyoming	1.44	1.23	-15
Arizona	1.43	1.21	-15
Colorado	1.43	1.47	3
Mississippi	1.43	1.26	-12
Kansas	1.42	1.27	-11
Kentucky	1.41	1.49	6
Arkansas	1.40	1.30	- 7
Illinois	1.40	1.22	-13
California	1.39	1.31	- 6
Michigan	1.38	1.26	- 9
Delaware	1.33	1.18	-11
Pennsylvania	1.33	1.31	- 2
Rhode Island	1.33	1.21	- 9
Florida	1.31	1.16	-11
New Jersey	1.31	1.20	- 8
New Mexico	1.30	1.03	-21
North Dakota	1.30	1.09	-16
South Carolina	1.30	1.17	-10
Massachusetts	1.27	1.19	- 6
Maryland	1.26	1.50	19
New York	1.25	1.59	27
Washington	1.25	1.23	- 2
West Virginia	1.24	1.25	1
Maine	1.22	1.15	- 6
Nebraska	1.20	1.28	7
Wisconsin	1.19	1.12	- 6
Indiana	1.18	1.22	3
Tennessee	1.16	1.41	22
Idaho	1.14	1.14	0
South Dakota	1.13	1.18	4
Utah	1.13	1.11	- 2
Minnesota	1.12	1.26	13
New Hampshire	1.08	1.14	6
Oregon	1.05	1.19	13
North Carolina	1.03	1.20	17
Iowa	1.01	1.09	8
Nevada	0.99	1.05	6

[a]Data unavailable, incomplete, or unreliable for Alabama, Alaska, Hawaii, Louisiana, Montana, and Vermont.

[b]Disparity is calculated as the expenditure level in the high-wealth quartile divided by the expenditure level in the low-wealth quartile.

its low-wealth quartile; in 1975, the high-wealth quartile received 1.40 times the expenditures received by the low-wealth quartile, constituting a disparity reduction of 8 percent.

The states are listed in order of decreasing disparity in 1970. The disparities in that year can be regarded as very severe indeed.[7] The presentation in this form reveals a significant finding that may have been obscured in the alphabetical listing in Table III: The states with the greatest wealth-related disparities in 1970 generally reduced those disparities in the five-year period. The correlation between disparity in 1970 and change is -.58. The states with the least wealth-related disparities in 1970 generally increased disparities (or, stated another way, permitted wealth to control expenditures to a greater extent); in some of these states, such as Minnesota, North Carolina, and Oregon, disparities increased to levels near the average for all states.

The average state had a wealth-related disparity of 1.29 in 1970, but this had declined to 1.25 by 1975. These are simple averages over all states, and therefore do not take into account the different enrollments in the states. As in our analysis of overall disparity, we are also concerned with how many children stand at what level of wealth-related disparity. Weighted by pupils, the wealth-related disparity in 1970 was 1.33; this is higher than the simple average over all states, indicating the extent to which wealth-related disparity is found in large states. But the weighted average for 1975 was 1.30, confirming that there had been some weakening, even if very slight, in the link between expenditures and local wealth.

This result, when viewed together with the earlier findings on overall disparity in the states, presents something of a puzzle. Because school finance is traditionally concerned with the link between disparity and local wealth, when we find that disparity is generally increasing, we expect that it is being driven by local wealth. Although there is obviously a connection, the results indicate that there has been some weakening in the expenditures-wealth link. It is clear that other forces are operating, but it is not clear what forces or how they are acting.

Disparities and Urban Status

Administrators in center city school districts have expressed a concern that school finance reform, if aimed at removing the link between expenditures and local wealth, may harm the cities, which generally have more than average property wealth per pupil. They argue that not as much of the wealth can actually be applied to education as in other places because cities bear disproportionately higher burdens for other municipal functions. They also argue that a comparison based on expenditures is open to question, because it does not take into account the higher costs of educational resources in the cities. There are therefore two questions of interest: How do expenditures in center city districts compare with expenditures in other districts, and what is the apparent wealth in these places?

Table V displays expenditures in center city districts in Standard Statistical Metropolitan Areas (SMSAs), other districts in SMSAs, and districts not in SMSAs. For each district grouping there are three columns: The 1970 and 1975 expenditures relative to the state average and the change in expenditure level over the period under study (as a percent of the 1970 level).

In interpreting the results, it is important to avoid placing undue emphasis on the relative resources available in one category of district without regard to the number of children in that category. In Kentucky, for example, center city districts in SMSAs spent at 1.14 of the state average, but such districts account for less than 10 percent of that state's total enrollment. For this reason an asterisk is used to identify any district category in a state in which there are less than 10 percent of the state's enrollment.

SMSA center city districts in most states spent at or above the state average in 1975. In more than half the states, spending in such districts was at least six percent higher than the state average. In most of the more urban and industrial states, such as Illinois, Massachusetts, and New York, spending was at least ten percent more than the state's average. A notable exception is Maryland, where Baltimore received only 83 percent of the state average. Other districts in SMSAs generally spent at about the state average; but in some of the less urbanized states, such districts spent very much more than the state average (in Kentucky, for instance, 20 percent more). Districts not in SMSAs generally spent at or below their state average.

It is appropriate to recall here the claim that the apparent advantage of the center cities would diminish if a measure were employed that was sensitive to the cost differences between urban and other places. This claim can reasonably be directed to the columns in the table that show relative expenditures in 1970 and 1975, for these are not adjusted for cost differences. The estimates of change presented in the table are much less affected by the lack of a cost adjustment; that is, the change in resources, however resources are measured, should provide meaningful information. Overall, center cities were gainers in half the states and losers in the others. If attention is directed solely to the states in which there are substantial numbers of population in center cities, however, it can be seen that the center-city districts generally kept about even or bettered their status from 1970 to 1975. Of course, it is necessary to view gains and losses in the perspective of where center cities stood in 1975; the center cities in Ohio, for instance, did not improve their status over this five-year period, but their 1975 expenditures were 1.14 of Ohio's average. From this perspective, when center cities lost or stayed even over the period, their 1975 spending was at or above the state average; the principal exception is again Maryland, where Baltimore lost ground over the period and, as noted above, spent 83 percent of the state average in 1975. Where there are gainers, there must be losers. But there is no uniform pattern; that is, when cities gained, the loss is sometimes to be found in other SMSA districts, sometimes in districts not in SMSAs, and sometimes in both of these district groupings.

Table V. Expenditures, 1970 and 1975, in Districts of Varying Urban Type (Expenditures Relative to the State Average)

	Center Cities in SMSAs			Other Districts in SMSAs			Districts Not in SMSAs		
	1970	1975	Change[a]	1970	1975	Change[a]	1970	1975	Change[a]
Alabama	1.04	1.02	- 2	0.99	1.03	4	0.98	0.98	0
Alaska	*			*			1.00	1.00	0
Arizona	1.17	1.01	-14	0.98	0.99	1	0.89	0.98	10
Arkansas	1.23	1.17	- 5	0.92	0.94	2	0.97	0.98	1
California	1.06	1.04	- 2	0.98	0.98	0	*0.93	0.93	0
Colorado	1.10	1.16	5	0.95	0.96	1	0.98	0.91	- 7
Connecticut	1.01	1.03	2	1.02	1.01	- 1	0.92	0.94	2
Delaware	1.25	1.27	2	1.03	1.01	- 2	0.86	0.90	5
Florida	0.93	0.97	4	1.03	1.04	1	0.95	0.96	1
Georgia	1.23	1.24	1	1.04	1.06	2	0.90	0.86	- 4
Hawaii	1.00	1.00	0	*					
Idaho	1.11	1.21	9	*0.81	0.83	2	0.99	0.98	- 1
Illinois	1.11	1.15	4	0.99	0.98	- 1	0.85	0.85	0
Indiana	1.09	1.07	- 2	0.96	0.95	- 1	0.96	0.97	1
Iowa	1.16	1.01	-13	0.94	0.97	3	0.96	1.00	4
Kansas	0.91	0.98	8	0.98	0.94	- 4	1.05	1.03	- 2
Kentucky	*1.25	1.14	- 9	1.12	1.20	7	0.91	0.91	0
Louisiana	1.06	1.01	- 5	0.98	1.01	3	0.97	0.99	2
Maine	1.02	0.99	- 3	1.14	1.11	- 3	0.98	0.99	1
Maryland	0.95	0.83	-13	1.05	1.08	3	0.85	0.90	6
Massachusetts	0.99	1.14	15	1.01	0.97	- 4	0.97	0.90	- 7
Michigan	1.08	1.04	- 4	1.03	1.02	- 1	0.86	0.93	8
Minnesota	1.06	1.17	10	1.01	0.97	- 4	0.97	0.97	0
Mississippi	*1.24	1.29	4	*0.94	0.93	- 1	0.98	0.98	0
Missouri	0.96	1.06	10	1.10	1.05	- 5	0.89	0.91	2
Montana	0.96	1.10	15	*1.05	0.82	-22	1.01	0.97	- 4
Nebraska	1.01	1.00	- 1	0.90	0.90	0	1.02	1.02	0
Nevada	1.05	0.98	- 7	0.95	0.98	3	1.09	1.07	- 2
N. Hampshire	0.95	0.95	0	0.99	0.90	- 9	1.01	1.02	1
N. Jersey	0.91	0.94	3	1.02	1.01	- 1	0.99	1.01	2
New Mexico	0.98	0.98	0	*			1.01	1.01	0
New York	1.04	1.17	13	1.01	0.93	- 6	0.89	0.79	-11
N. Carolina	1.15	1.15	0	0.92	1.00	9	0.97	0.95	- 2
N. Dakota	*1.33	1.22	- 8	*1.03	0.99	- 4	0.96	0.98	2
Ohio	1.15	1.14	- 1	1.01	1.00	- 1	0.83	0.86	- 4
Oklahoma	1.12	1.09	- 3	0.88	0.94	7	0.99	0.97	- 2
Oregon	0.98	1.08	10	1.00	0.98	- 2	1.01	0.97	- 4
Pennsylvania	1.16	1.09	- 6	0.99	1.00	1	0.89	0.90	1
R. Island	1.17	1.12	- 4	0.90	0.93	3	0.99	1.02	3
S. Carolina	*1.11	1.28	15	1.02	0.98	- 4	0.98	0.99	1
S. Dakota	1.08	1.03	- 5	*1.12	0.94	-16	0.99	1.00	1
Tennessee	1.24	1.21	- 2	1.15	0.99	-14	0.83	0.89	7
Texas	0.98	0.99	1	0.95	0.98	3	1.08	1.04	- 4
Utah	1.05	1.07	2	0.96	0.95	- 1	1.05	1.08	3
Vermont	*			*			1.00	1.00	0
Virginia	1.06	1.10	4	1.07	1.11	4	0.94	0.83	-10
Washington	1.18	1.19	1	1.01	0.98	- 3	0.87	0.91	5
W. Virginia	*1.19	1.10	- 8	1.14	1.13	- 1	0.93	0.95	2
Wisconsin	1.01	1.09	8	1.06	1.02	- 4	0.94	0.93	- 1
Wyoming	*			*			1.00	1.00	0

[a]Change is (1975 - 1970) ÷ 1970.

*Less than 10 percent of the state's pupils are in districts of this urban type.

The second issue of interest in center-city districts is the extent to which property valuation may present a misleading estimate of a district's ability to support education. Table VI presents, for the three district groupings, property valuation per pupil (EPV/PUP) and property valuation per capita (EPV/CAP) in 1975; EPV/CAP is used here as an approximate surrogate of the burden of municipal functions other than education. Both EPV/PUP and EPV/CAP are expressed relative to the state's average. The perception of a center-city district's ability to support education varies sharply under the two measures. When EPV/PUP is employed, center cities in most states have higher -- in many instances, much higher -- wealth than other districts. When EPV/CAP is used, the apparent advantage is considerably diminished. The use in this comparison of total population as a base does not imply that it is preferred to the more well-known measure of property valuation per pupil; it is used to demonstrate the sensitivity of results to the measure selected.

Table VI. District Wealth by Urban Type, for Two Wealth Measures, 1975
(Relative to State Average Wealth)

	Center City in SMSA		Other in SMSA		Not in SMSA	
	EPV/PUP	EPV/CAP	EPV/PUP	EPV/CAP	EPV/PUP	EPV/CAP
Alabama	1.25	1.17	1.04	1.0	0.84	0.87
Alaska	n/a	n/a	n/a	n/a	n/a	n/a
Arizona	1.05	0.87	0.88	1.11	1.04	1.26
Arkansas	1.41	1.10	0.82	1.06	0.96	0.96
California	0.89	0.90	1.05	1.05	1.17	1.10
Colorado	1.45	1.05	0.75	0.93	1.00	1.03
Connecticut	1.01	0.81	1.00	1.09	0.99	1.14
Delaware	1.13	0.86	1.15	1.13	0.72	0.83
Florida	0.69	0.67	1.20	1.11	0.89	1.02
Georgia	1.41	1.19	0.95	0.99	0.85	0.90
Hawaii	n/a	n/a	n/a	n/a	n/a	n/a
Idaho	1.05	0.91	0.64 *	1.17	1.01	1.01
Illinois	0.78	0.78	1.19	1.10	0.89	1.06
Indiana	1.12	0.97	0.91	1.04	0.96	1.00
Iowa	0.88	0.78	0.83	0.96	1.08	1.10
Kansas	0.76	0.65	0.79	0.89	1.16	1.16
Kentucky	1.55 *	1.33	1.28	1.21	0.84	0.87
Louisiana	1.43	1.27	0.75	0.75	0.79	0.86
Maine	1.24	0.92	1.16	1.17	0.95	0.99
Maryland	0.63	0.54	1.15	1.18	0.86	0.95
Massachusetts	0.79	0.64	1.04	1.12	1.17	1.23
Michigan	1.07	0.81	1.01	1.08	0.94	1.08
Minnesota	1.55	0.98	0.90	1.10	0.88	0.93
Mississippi	2.36 *	1.66	0.79 *	1.06	0.89	0.90
Missouri	1.20	0.94	1.07	1.18	0.79	0.87
Montana	0.88	0.91	1.02 *	1.20	1.05	1.03
Nebraska	1.02	0.88	0.60	1.07	1.08	1.09
Nevada	1.19	1.07	0.89	0.92	1.10	1.15
N. Hampshire	1.00	0.89	0.78 *	0.91	1.02	1.04
New Jersey	0.58	0.63	1.10	1.02	1.02	1.16
New Mexico	0.76	0.73	*		1.11	1.13
New York	1.33	0.94	0.89	1.10	0.66	0.93
N. Carolina	1.45	1.31	0.97	0.99	0.86	0.89
N. Dakota	1.03 *	0.77	1.38 *	1.51	0.98	1.01
Ohio	1.11	0.87	1.02	1.11	0.84	0.95
Oklahoma	1.48	1.26	0.68	0.84	0.82	0.85
Oregon	1.30	1.04	0.83	0.88	0.97	1.09
Pennsylvania	1.22	0.92	1.02	1.10	0.73	0.88
R. Island	1.13	0.94	0.89	1.02	1.12	1.06
S. Carolina	1.11 *	0.83	1.03	1.04	0.97	1.00
S. Dakota	0.82	0.77	1.03 *	1.27	1.02	1.03
Tennessee	1.34	1.13	1.01	1.10	0.82	0.88
Texas	0.95	0.84	0.82	1.01	1.29	1.34
Utah	1.44	0.83	0.80	0.98	1.20	1.26
Vermont	*	*	*		1.00	1.00
Virginia	0.98	0.75	1.07	1.17	0.94	1.00
Washington	1.49	1.00	0.79	0.93	1.01	1.09
W. Virginia	1.45 *	1.15	1.30	1.21	0.87	0.92
Wisconsin	1.03	0.87	1.10	1.19	0.92	1.00
Wyoming	*		*		1.00	1.00

*Less than 10 percent of the State's children are in districts of this grouping.

IV. State Aid and Spending Levels

In this section we examine two aspects of state funding that may help to shed light on sources of disparity or methods for overcoming disparity: the proportion of a state's total spending that is from state funds and the absolute level of spending in a state.

The Role of State Aid

Much has been made of the role of state aid as an equalizing force. At the two extremes there is an obvious connection. If a state assumes a very high share of total spending (and if it also distributes its aid equitably), total funds will be distributed in a very nearly equalized way. In a state that assumes very little of total spending, the result will be a pattern of spending that is almost entirely subject to the influence of local wealth differences; in such a situation, disparities will be constrained only to the extent that the available state aid is directed to low-wealth districts and to the extent that spending caps are placed on high-wealth districts. All the states except Hawaii are between these two extremes, and the question then arises, What is the relation between proportion of state aid and equalization?

The data bases used in this study make it possible to calculate the proportion of state aid in 1970 and 1975. Estimating the percentage change is not as straightforward, however, as might be thought. It would seem natural to calculate change as in the preceding analyses: the difference in the state share of state and local revenues (including SAFA), expressed as a percentage of 1970 state aid, as in:

$$\frac{\%1975 \text{ State Aid} - \%1970 \text{ State Aid}}{\%1970 \text{ State Aid}} .$$

This quantity is indeed a measure of change in state aid, but an example will show that this may not be what we want to measure. Consider state A, which assumed as state aid 20 percent of total funds in 1970 and 30 percent in 1975, and state B, which assumed 40 and 60 percent in the two years. For both states, the change is calculated as 50 percent. It can be argued, however, that state B has made the more meaningful change in reducing the dependence on local revenue; it is this dependence that is the real interest in school finance, not merely the percent change in state aid. From this perspective, it is more appropriate to calculate:

$$\frac{\%1975 \text{ State Aid} - \%1970 \text{ State Aid}}{100 - \%1970 \text{ State Aid}} .$$

In the two examples above, state A made an effective change in percent of state aid of 12.5 percent, and state B changed by 33.3 percent. The difference between these results seems to us to reflect the difference between the states in beneficial change.

Table VII shows, for each state, the percentage of state aid in 1970, the percentage in 1975, and the change in the five-year period,

Table VII. Percentage State Aid, 1970 and 1975, and Change in Dependence on Local Revenue

	Percent State Aid		
	1970 (1)	1975 (2)	Change* (3)
Alabama	72	62	-36
Alaska	67	69	6
Arizona	55	50	-11
Arkansas	51	51	0
California	37	41	6
Colorado	28	46	25
Connecticut	24	24	0
Delaware	71	67	-14
Florida	67	58	-11
Georgia	60	47	-33
Hawaii	(98)	(90)	(-400)
Idaho	51	48	- 6
Illinois	29	40	15
Indiana	39	39	0
Iowa	27	44	23
Kansas	33	39	9
Kentucky	63	50	-35
Louisiana	64	59	-14
Maine	43	46	5
Maryland	37	41	6
Massachusetts	21	28	9
Michigan	44	35	-16
Minnesota	46	56	18
Mississippi	67	65	- 6
Missouri	37	38	2
Montana	31	37	9
Nebraska	21	22	1
Nevada	40	55	25
N. Hampshire	8	7	- 1
N. Jersey	22	25	4
New Mexico	75	69	-24
New York	48	40	-13
N. Carolina	71	65	-21
N. Dakota	30	44	20
Ohio	28	35	10
Oklahoma	44	48	7
Oregon	23	27	5
Pennsylvania	47	45	- 4
R. Island	34	34	0
S. Carolina	67	56	-33
S. Dakota	15	17	2
Tennessee	55	45	-22
Texas	48	45	- 6
Utah	58	54	-10
Vermont	36	26	-16
Virginia	38	32	-10
Washington	55	50	-11
W. Virginia	59	60	2
Wisconsin	28	46	25
Wyoming	40	31	-15

*Column 2 less column 1, divided by 100 less column 1.

as defined above. The entry for Hawaii can be disregarded; because its percentage of state aid is extremely high, a small change produces an exaggerated percentage change. The dependence on local revenue increased in about as many states as it decreased. If we consider only those states that increased or decreased the dependence on local revenue by 10 percent or more, however, we see that there was a decided tendency to increased dependence: 18 states increased the dependence by at least 10 percent, and only 8 decreased by at least 10 percent. In general (albeit with exceptions), states whose aid was higher than 50 percent in 1970 moved downward, and states whose aid was lower than 50 percent moved up. (The correlation between state share in 1970 and change in state share, as defined here, is -.65.) This is an interesting finding for which no explanation is readily at hand. It is possible that natural political forces are at work, so that those who bear the greatest burden at a given time are in a position to lessen their burden, or so that those whose burden is least at a given time may be less reluctant to increase their share.

State Spending Levels

The level of spending in a state as a whole could be of interest for a number of reasons. It might be conjectured, for instance, that a state that spends at high levels or that increases its spending sharply is doing so because some of its wealthier districts are expressing their preference for higher levels. If this is so, disparities and their wealth-related incidence could be expected to increase. Conversely, in states in which spending increases are held to a minimum, it is possible that the normal operation of a school financing system (even one that had not been explicitly reformed) would lead to reduced disparities. And, in addition, if minimum increases had occurred where there are caps on spending by high-wealth districts, the wealth link would normally be expected to decrease.

Table VIII provides some of the data needed for an analysis of such phenomena. For each state, its spending level relative to the national average is shown for 1970 and 1975; and the right-hand column shows the change over the five-year period. Spending, relative to the national average, increased in 31 states, remained the same in 5, and decreased in only 14. At first glance, this result seems anomalous, because there should be about as many losers as there are gainers. Closer inspection of the results clarifies what has been happening. The less populous states increased their relative spending by small amounts, and many of the most populous states decreased their relative spending by larger amounts.

Table VIII. Spending Levels, Relative to National Average, 1970 and 1975

	1970 Revenues (1)	1975 Revenues (2)	Change* (3)
Alabama	48	56	17
Alaska	139	159	14
Arizona	88	100	14
Arkansas	55	58	5
California	106	100	- 6
Colorado	97	97	0
Connecticut	111	113	2
Delaware	99	102	3
Florida	93	96	3
Georgia	64	71	11
Hawaii	78	104	33
Idaho	68	74	9
Illinois	129	112	-13
Indiana	81	98	21
Iowa	113	102	-10
Kansas	100	100	0
Kentucky	68	67	- 1
Louisiana	77	77	0
Maine	86	83	- 3
Maryland	113	127	12
Massachusetts	123	138	12
Michigan	122	100	-18
Minnesota	115	113	- 2
Mississippi	54	54	0
Missouri	90	88	- 2
Montana	87	95	9
Nebraska	82	97	18
Nevada	98	89	- 9
N. Hampshire	93	93	0
New Jersey	116	118	2
New Mexico	78	80	3
New York	159	167	5
N. Carolina	70	77	10
N. Dakota	83	85	2
Ohio	99	87	-12
Oklahoma	62	68	10
Oregon	111	110	- 1
Pennsylvania	109	111	2
R. Island	96	108	13
S. Carolina	60	62	3
S. Dakota	77	85	10
Tennessee	59	65	10
Texas	70	76	9
Utah	83	88	6
Vermont	115	127	10
Virginia	81	83	2
Washington	111	99	-11
W. Virginia	75	70	- 7
Wisconsin	117	112	- 4
Wyoming	96	105	9

*Change is (1975-1970) ÷ 1970.

State Aid, State Spending, and Disparities

Table IX brings together some data that relate the factors of state share and state spending level to disparities. The first two columns are from Table VII, the second two from Table VIII, and the last two from Table I. The table leads to the following observations:

- Generally, states that assume a high share of total state spending exhibit lower disparity ratios. The correlation between state share and disparities is -.45.

- There seems to be no strong relation between the level of spending as a whole and disparity. The correlation between spending level and disparity in 1975 was only .13.

- There is surprisingly little relation between the change in state aid and the change in disparity between 1970 and 1975. The correlation of -.18 may seem surprisingly small. The explanation may lie in the phenomenon noted earlier of high-share states decreasing their share and low-share states increasing their share.

Table IX. State Aid, Spending Level, and Disparity

	State Share		Spending Level		Disparity (95:5)	
	1975	Change	1975	Change	1975	Change
Alabama	62	-36	56	17	1.43	0
Alaska	69	6	159	14	1.29	- 1
Arizona	50	-11	100	14	1.71	- 9
Arkansas	51	0	58	5	1.78	- 9
California	41	6	100	-6	2.02	9
Colorado	46	25	97	0	1.77	1
Connecticut	24	0	113	2	2.29	3
Delaware	67	-14	102	3	1.70	-17
Florida	58	-11	96	3	1.30	-15
Georgia	47	-33	71	11	2.41	30
Hawaii	90	0	104	33	1.00	0
Idaho	48	- 6	74	9	1.51	1
Illinois	40	15	112	13	1.90	- 7
Indiana	39	0	98	21	1.50	- 6
Iowa	44	23	102	10	1.34	-26
Kansas	39	9	100	0	1.65	-11
Kentucky	50	- 35	67	-1	1.86	8
Louisiana	59	-14	77	0	1.32	- 1
Maine	46	5	83	-3	1.67	6
Maryland	41	6	127	12	1.77	11
Massachusetts	28	9	138	12	2.17	12
Michigan	35	-16	100	-18	1.71	- 5
Minnesota	56	18	113	- 2	1.62	11
Mississippi	65	- 6	54	0	1.80	5
Missouri	38	2	88	2	1.73	- 6
Montana	37	9	95	9	1.97	3
Nebraska	22	1	97	18	1.73	6
Nevada	55	25	89	- 9	1.18	- 1
N. Hampshire	7	- 1	93	0	1.78	- 5
N. Jersey	25	4	118	2	1.95	1
N. Mexico	69	-24	80	3	1.41	- 7
N. York	40	-15	167	5	1.85	13
N. Carolina	65	-21	77	10	1.51	1
N. Dakota	44	20	85	2	1.53	-22
Ohio	35	10	87	-12	1.78	0
Oklahoma	48	7	68	10	1.51	-10
Oregon	27	5	110	- 1	1.50	0
Pennsylvania	45	- 4	111	2	1.57	0
R. Island	34	0	108	13	1.58	-10
S. Carolina	56	-33	62	3	1.65	- 1
S. Dakota	17	2	85	10	1.50	-12
Tennessee	45	-22	65	10	1.90	- 1
Texas	45	- 6	76	9	1.79	- 6
Utah	54	-10	88	6	1.27	0
Vermont	26	-16	127	10	1.99	-41
Virginia	32	-10	83	2	1.78	7
Washington	50	-11	99	-11	1.83	10
W. Virginia	60	2	70	- 7	1.49	0
Wisconsin	46	25	112	- 4	1.59	- 1
Wyoming	31	-15	105	9	1.32	16

V. The Costs of Equalization

If the disparities reviewed here are severe enough to warrant remedial action, the next question is, What are the costs of further equalization? It is theoretically possible, of course, to reduce disparities by shifting state aid sharply from high-spending to low-spending districts. This strategy is conceivable only for states that have a history of high percentage state aid; but even for them it may be politically difficult, if not impossible. We therefore assume here that the method would be to increase the spending, through new dollars, in low-spending districts, while holding higher-spending districts at the current level (1975 levels, in view of our data base). The resulting costs are calculated for a range of levels of disparity; there is no consensus on what degree of disparity should constitute a satisfactory level of equity, and the extent of disparity that will be tolerated is in all probability going to depend on perceptions of what can be afforded.

The method used here to calculate equalization costs — leveling all low-spending districts up — differs from that employed by the staff of the President's Commission on School Finance. (See Review of Existing State School Finance Programs, Volume II.) In selecting the districts to be leveled up, they excluded the five percent of each state's children who were in the lowest-spending districts, thus leaving these children exactly where they were before equalization. Whatever justification there may be for excepting the bottom five percent from a disparity test (and we have argued above that the justification may be weak), there appears to be no rationale that would exclude them from the benefits of equalization. Estimating disparity and estimating equalization costs have different purposes and require different calculation methods.

Table X shows the costs of leveling each state up to a selected disparity ratio in 1975, using the 95:5 measure. Nationally, the costs of leveling up to a disparity ratio of 1.4 in each state would have been $2.55 billion, and the costs to achieve the Office of Education's disparity ratio of 1.25 would have been $5.4 billion. Costs increase fairly proportionately to decreases in the ratio. It is noteworthy that, of the $2.55 billion required to decrease disparity in each state to 1.4, approximately 32 percent is accounted for by the nation's two most populous states, California and New York, which enroll some 16 percent of the nation's public elementary and secondary school students.

The costs of equalization increased, of course, from 1970 to 1975. A large part of the increase is attributable to inflation; the effect of inflation is cancelled if we look at equalization costs in each year as a percentage of the budget in that year. These figures are shown in Table IX for the nation as a whole in 1970 and 1975, for several values of the 95:5 disparity ratio. For each level of equalization, the nation would have had to add a greater percentage of its budget in 1975 than in 1970. This calculation provides an additional way to estimate changes

Table X. Cost to Level Each State to Selected Disparity Ratios, 1975 (Millions of Dollars)

	95:5 Disparity Ratio						
	1.40	1.30	1.25	1.20	1.15	1.10	1.05
Alabama	1	7	14	24	38	54	73
Alaska	1	1	3	6	9	12	17
Arizona	20	35	45	61	80	101	125
Arkansas	23	39	49	61	75	90	107
California	468	792	989	1,218	1,470	1,753	2,067
Colorado	29	58	78	100	126	155	187
Connecticut	68	108	133	162	198	239	284
Delaware	6	12	17	22	28	35	42
Florida	-	3	7	15	29	64	109
Georgia	210	275	311	352	396	445	498
Hawaii	0	0	0	0	0	0	0
Idaho	2	5	8	12	16	22	28
Illinois	168	272	338	415	503	603	720
Indiana	8	21	33	50	71	100	143
Iowa	2	3	6	12	23	41	67
Kansas	9	24	39	57	78	102	128
Kentucky	31	51	64	80	98	118	142
Louisiana	0	1	5	13	26	43	66
Maine	5	10	15	21	28	36	46
Maryland	87	138	178	222	270	321	378
Massachusetts	262	375	442	514	595	684	783
Michigan	83	161	229	308	401	515	647
Minnesota	25	53	77	108	148	191	240
Mississippi	34	55	67	81	96	114	134
Missouri	35	63	82	106	137	177	221
Montana	12	20	25	33	42	51	62
Nebraska	9	16	23	33	47	59	74
Nevada	-	-	1	1	3	8	14
N. Hampshire	7	13	18	24	31	38	47
New Jersey	130	212	267	333	414	507	612
New Mexico	-	2	3	6	12	22	33
New York	339	529	647	783	940	1,121	1,325
N. Carolina	9	35	59	91	126	168	217
N. Dakota	1	4	6	9	13	18	24
Ohio	97	172	221	275	342	423	521
Oklahoma	3	11	19	27	39	53	72
Oregon	4	12	17	25	37	52	71
Pennsylvania	37	93	134	187	255	338	436
R. Island	3	7	11	16	22	30	41
S. Carolina	11	26	37	53	71	92	115
South Dakota	1	3	6	10	15	21	28
Tennessee	57	87	104	124	150	180	214
Texas	86	153	207	277	358	453	565
Utah	0	0	-	3	11	21	32
Vermont	8	12	15	18	22	26	32
Virginia	78	120	148	180	217	258	303
Washington	50	91	116	147	182	221	267
W. Virginia	2	6	11	18	27	38	50
Wisconsin	16	37	53	77	107	145	190
Wyoming	13	20	24	29	34	40	46
U.S.	2,552	4,243	5,401	6,800	8,455	10,401	12,644

Note: Figures may not add due to rounding.

in disparity over the period under study, and it confirms the evidence presented earlier: relatively little change has taken place in this five-year period, and the change appears to have been in the wrong direction.

Table XI. National Equalization Costs, 1970 and 1975, at Selected Disparity Ratios

	95:5 Disparity Ratio						
	1.40	1.30	1.25	1.20	1.15	1.10	1.05
1970							
Eq. Cost ($M)	1,259	2,221	2,894	3,715	4,763	6,005	7,421
% of 1970 Budget	4.4	7.7	10.0	12.9	16.5	20.8	25.7
1975							
Eq. Costs ($M)	2,552	4,243	5,401	6,800	8,455	10,401	12,644
% of 1975 Budget	5.3	8.7	11.1	14.0	17.4	21.4	26.0

Added importance must therefore be attached to the effects of reform in the 20 states that have legislated changes in their school finance systems.

VI. The Reform States

Based on the preceding analyses it is now possible to focus on the states that are regarded as "reform states" by virtue of changes that have been legislated in their school finance programs. The question is whether the legislative changes have resulted in changes in equalization. It must be pointed out, first, that the concerns addressed in this study are overall disparities and the incidence of disparities by local wealth, concerns which reflect those that have come before state courts. Reform stemmed from several sources, including resistance to school property tax levies. Relief from the burdens of the property tax -- either in the sense of relieving imbalances across different populations or of reducing the total burden -- is an important factor that was not studied here.

The states that are considered here as having reformed are:[8]

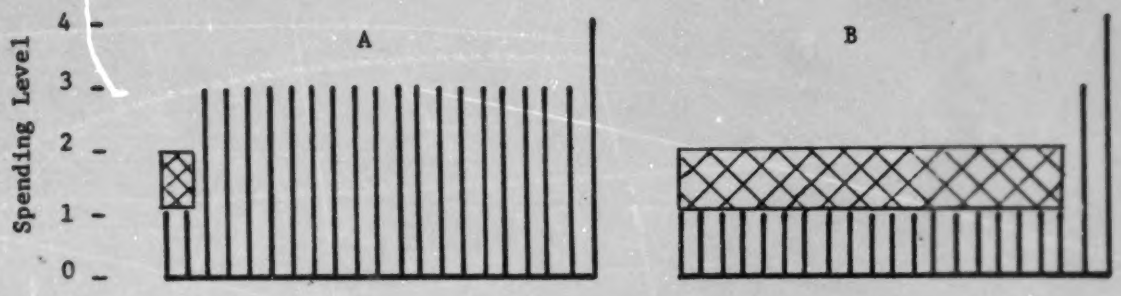
Arizona	Michigan
California	Minnesota
Colorado	Montana
Connecticut	New Jersey
Florida	New Mexico
Illinois	North Dakota
Indiana	Ohio
Iowa	Texas
Kansas	Utah
Maine	Wisconsin

It could be argued that New Jersey should not be included on the grounds that it legislated a change to its financing system but did not fund it. It is included here on the rationale that failing to fund a legislated program is just as much a part of the reform movement as funding at too low a level to have substantial effect.

A principal consideration is the extent of disparity and the change in disparity in the five-year period under study. We noted earlier that the costs of further equalization can serve as a convenient indicator of disparity. We know from that discussion that the costs of equalizing all states in the nation, as a percentage of budgets, have increased from 1970 to 1975, and thus disparities have increased also. The same method can be used to evaluate change in reform versus non-reform states.

A comment is in order first, however, on the difference between this indicator of disparity and the 95:5 ratio. In computing the costs of equalization, the method is to increase spending in <u>all</u> low-spending districts (while holding high-spending districts at their present levels) until the 95:5 disparity ratio reaches the standard selected for analysis. The 95:5 disparity ratio is insensitive to differences in the distribution of spending across the percentiles (other than at the two percentiles on which it is based), and states can differ considerably in their distribution. The method of computing equalization costs does, however, take the varying distributions into account, as can be seen in the sketch below. States A and B have the same value of the 95:5 ratio (3.00). To equalize to a 95:5 ratio of 1.5 requires bringing all low-spending districts up to

spending level 2 on the sketch. For state A, this entails a very modest increase in total spending (the increase is indicated by the cross-hatched area); but for state B the amount is very considerable indeed. Accordingly, the results of this disparity measure can be expected to differ from the 95:5 disparity ratios shown in Table I, to the extent that states differ in their distributions.



With these comments in mind, it is instructive to review Table XII, which shows the costs of equalization, as a percent of the budget, in 1970 and 1975, for the reform states individually and for the non-reform states as a group. Since the purpose of the table is to provide another way to view disparity, equalization costs are shown for only one value of the 95:5 ratio -- 1.40. For convenience, the table also lists the percent change according to the two measures presented in Table I, the 95:5 ratio and the coefficient of variation.

Table XII. Costs, as a Percent of Budget, for Reform States to Equalize to 95:5 Disparity of 1.40, in 1970 and 1975

Reform States	Percent Budget to Equalize			Percent Change in:	
	1970	1975	Change	95:5 Ratio	Coeff. Var.
Arizona	5.4	4.2	-22	- 9	-19
California	5.6	8.6	54	9	0
Colorado	1.6	4.5	181	1	13
Connecticut	8.7	8.6	- 1	3	- 9
Florida	1.5	0.0	—	-15	-31
Illinois	8.8	6.1	-31	- 7	- 4
Indiana	1.4	0.7	-50	- 6	- 7
Iowa	11.4	0.3	-97	-26	-50
Kansas	6.9	1.8	-74	-11	-36
Maine	1.8	2.1	17	6	0
Michigan	5.4	3.3	-39	- 5	-11
Minnesota	0.7	2.5	257	11	15
Montana	7.3	5.9	-19	3	11
New Jersey	6.6	6.5	- 2	1	0
New Mexico	0.7	0.1	-86	- 7	- 7
North Dakota	4.0	0.8	-80	-22	-18
Ohio	4.4	4.8	9	0	5
Texas	5.5	3.8	-31	- 6	-13
Utah	0.0	0.0	—	0	0
Wisconsin	1.5	1.5	0	- 1	0
Reform States as a Group:	5.4	4.7	-13		
Non-Reform States as a Group:	3.2	5.9	84		

The changes according to the three measures are broadly in agreement, but there are some differences. The percent costs of equalization increased sharply in California, Colorado, and Minnesota to an extent that would not have been predicted on the basis of the Table I measures. The percent costs decreased more sharply in Illinois, Indiana, and Montana than would have been predicted from the other measures.* Taking all three measures into account, the greatest progress appears to have been made by Arizona, Florida, Illinois, Indiana, Iowa, Kansas, Michigan, New Mexico, North Dakota, and Texas. Several states appear to have fallen behind: California, Colorado, and Minnesota by large margins, and Maine and Ohio by lesser margins. And, of course, Utah and Wisconsin, although not showing progress, were relatively well equalized in 1970 compared with other reform states.

The most striking findings are those that stem from a review of the last two rows of the table. In 1970 the reform states as a group would have required an increase of 5.4 percent in their total budget to equalize to a 95:5 ratio of 1.40, and the non-reform states would have required 3.2 percent additional.† That indicates that the states that reformed were, as a group, those most in need of reform in 1970. By 1975, the reform states had reversed the situation, for it is the non-reform states that would have to apply a greater addition to their budgets to equalize. These findings do not alter the conclusions throughout this study that, for the nation as a whole, disparities have worsened; but they help to identify the source. Even though, as a group, the reform states have accomplished relatively little towards equalization, they have been swimming against a national current of increasing disparity.

Table XIII presents a variety of results to summarize the extent of change in the 20 reform states. The first column is a judgment regarding the increase or decrease in disparity, based on the three measures shown in the preceding table. The second column is a judgment regarding the weakening of the link between expenditures and local wealth; the criterion for improvement is a decrease in the wealth-related disparity (Table IV) of at least five percent. The third column shows the change in state share, defined as the change in dependence on local revenue (Table VII). The final column shows the direction of change of the spending level in the state relative to the national average.

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*In assessing the status of two of the reform states -- Illinois and Montana -- it is necessary to recall, as was stated in the Introduction, that no adjustment was made in this study for possibly justifiable differences in spending levels in non-unified districts. An adjustment was not made because (1) there is no accepted standard for justifiable differences and (2) the effects on the results are negligible for almost all states, as is shown in Appendix A. In Illinois, disparity in 1970 according to the 95:5 measure was 2.05 when no adjustment is made, but is 1.91 when an adjustment is made; the difference can be regarded as small, for the purposes of this study. In Montana, however, the disparity is 1.91 unadjusted and 1.59 adjusted. A difference of this magnitude suggests the desirability of conducting a similar analysis using an adjustment (even one that is not universally agreed to).

†Group figures are obtained by dividing total additional costs by total budget.

Table XIII. Summary of Findings for the Reform States

	Disparity Decrease?	Wealth Link Decrease?	State Share	Spending (Rel. to Nat'l Avg.)
Arizona	DEC	DEC	DOWN	UP
California	INC	DEC	UP	DOWN
Colorado	INC	—	UP	—
Connecticut	—	DEC	—	UP
Florida	DEC	DEC	DOWN	UP
Illinois	DEC	DEC	UP	DOWN
Indiana	DEC	—	—	UP
Iowa	DEC	INC	UP	DOWN
Kansas	DEC	DEC	UP	—
Maine	INC	DEC	UP	DOWN
Michigan	DEC	DEC	DOWN	DOWN
Minnesota	INC	INC	UP	DOWN
Montana	—	a	UP	UP
New Jersey	—	DEC	UP	UP
New Mexico	DEC	DEC	DOWN	UP
North Dakota	DEC	DEC	UP	UP
Ohio	INC	DEC	UP	DOWN
Texas	DEC	DEC	DOWN	UP
Utah	—	—	DOWN	UP
Wisconsin	—	DEC	UP	DOWN

[a]Data not reliable.

From 1970 to 1975, overall disparities decreased in 10 of the reform states, increased in 5, and stayed at about the same level in 5. This mixed picture of the effectiveness of reform would not be discouraging if disparities were moderate in 1975; but only 5 of the reform states -- Iowa, Indiana, Florida, New Mexico, and Utah -- had disparities (on the 95:5 measure) of 1.50 or less in that year. A different pattern emerges when we examine disparities related to wealth: the expenditures-wealth link weakened in 14 states, stayed the same in 3 states, and increased in only 2 states. Even this count underestimates progress: Iowa, in which the link strengthened, and Utah, in which there was little change, both had very low wealth-disparity ratios in 1975. Thus, of the 19 reform states for which data are available (omitting Montana), all except 2 either showed improvement in reducing this link or were relatively equalized in 1975. This confirms our earlier finding, for the nation as a whole, that overall disparity and wealth-related disparity are two different, although related concerns.

It might appear reasonable to expect that a state would be able to reduce disparities and their link with local wealth only by increasing its share of total revenues or also increasing the spending level in the state. No pattern emerges from the last two columns of the table to support such a conjecture. For example, Florida decreased its share while increasing only modestly the spending level, a pattern that might be thought to be associated with increased disparity; yet that state made significant strides in meeting both equalization goals. Minnesota increased its share and decreased its spending level, but disparities increased there. It is obvious that the data used in the present study are not adequate to detect the underlying influences that relate disparities to these two factors (if indeed there are influences that operate commonly in all states).

VII. SUMMARY AND CONCLUSIONS

The 1970s marked a time in which increased concern has arisen over disparities in the resource levels among school districts in the states. Disparities have been strongly influenced by the traditional dependence of the education revenue system on taxation of local wealth, which is distributed nonuniformly throughout each state. In recent years, some 20 states -- many of them prompted by their state courts -- have legislated changes to their school finance programs. This study assesses the extent of progress in the reform movement, against the background of changes in the other states.

The school finance reform movement has been studied extensively, most often through studies of one or a few states. Because these studies employ different data and methodology, it is difficult to draw conclusions about the movement as a whole. The present study analyzes all the states on a consistent basis, using the same data and methodology, thus making it possible to contrast reform with non-reform states. The assessment is based primarily on the distribution of educational resources -- how much disparity there is in the distribution and how strongly the disparity is related to local wealth. These are important concerns of school finance reform -- perhaps the fundamental concerns -- but they are not the only ones. Other possible state objectives, such as reduction in the property tax burden, have not been studied here. The study draws on data from a sample of school districts selected to be representative of each state. Although it is always preferable to study the universe of school districts rather than a sample, the results show sufficiently strong directions that they would probably not be significantly altered by improved data.

Overall Disparity

The study uses two measures of expenditure disparity: (1) the ratio of expenditures at the 95th percentile of students to expenditures at the 5th percentile; and (2) the average variation (standard deviation) expressed as a percentage of average expenditures in a state. Results according to the two measures are very similar. The findings are as follows:

- In 1970: In 40 states the high-spending districts spent at least 50 percent more than the low-spending districts, and in 4 of these states the high-spending districts spent at least twice as much. In 34 states the average variation in per-pupil expenditures was at least 15 percent.

- By 1975: None of the numbers above had changed. Moreover, the national average disparity (the 95:5 measure weighted by pupils) changed from 1.74 in 1970 to 1.75 in 1975. The conclusion must be reached that disparities have, if anything, increased.

A disparity measure merely calculates the extent of disparity; it does not set a standard of permissible disparity. One standard is

contained in a federal program, which stipulates that to qualify a state must exhibit a 95:5 ratio no greater than 1.25. According to the results of this study, only Hawaii and Nevada would have met this criterion in 1975. Even allowing for measurement error in this study, it is doubtful that more than a handful of states met the criterion in that year.

Wealth-Related Disparities

- In 1970: In 32 states (of the 44 for which data are available) the fourth of the students in districts of greatest local wealth received at least 20 percent more, on average, than the fourth in low-wealth districts.

- By 1975: Of those 32 states, 24 had reduced wealth-related disparities. Moreover, such disparities were generally reduced in the most populous states. Although in almost all states the low-wealth districts remained at a distinct disadvantage relative to wealthier places, wealth-related disparities have decreased nationally in the five-year period.

This result presents something of a puzzle. Because a large part of overall disparity in the states is due to differences in local wealth, it is expected that when overall disparities increase they are caused by increases in wealth-related disparities. The fact that the link between wealth and expenditures has weakened, although only slightly, indicates that other forces are operating; and, in turn this suggests that the process of developing effective reform in school finance is even more complex than has been generally recognized.

Center City School Districts

Center city school districts have expressed fears that they would be the losers in school finance reform, both because they generally have higher than average expenditures per pupil and because they have greater than average property valuation per pupil. They would argue that their higher expenditures per pupil are justified by greater pupil needs and high costs. The study confirms that center city districts in most states spend more than other places, but it did not examine the impact of pupil needs or costs on expenditures. Such districts would also argue that the traditional measure of local wealth does not reflect the added burden on cities caused by non-education functions. The study confirms that in most states the center city districts have higher property wealth per pupil; but the apparent advantage of such districts is reduced considerably when the measure of fiscal capacity is shifted to property valuation per capita, which is an approximate way of reflecting the service burden placed on cities by all sectors of the population.

These findings suggest that any evaluation of the relative standing of center city school districts in a state must take into account such factors as pupil needs, relative costs, and measures of ability to pay.

The Reform States

The 20 states considered here as having reformed can be compared with non-reform states in several ways. With respect to overall disparities:

- In 1970: The states that reformed were, at this time, those most in need of reform. That is, if each state had to equalize to the same standard, the reform states as a group would have had to make a greater increase in their 1970 budgets than the non-reform states.

- By 1975: The reform states had reversed the situation, and the non-reform states exhibited the greater overall disparities. However, only 2 reform states had disparity ratios close to the federal standard of 1.25, and 6 reform states ranked among the 8 states in the nation with the greatest disparities.

With respect to wealth-related disparities:

- In 1970: The reform states were generally representative of the nation as a whole. The group included states with very high wealth-related disparities and states with relatively low disparities.

- By 1975: Most of the reform states had reduced wealth-related disparities or were already relatively well equalized with respect to wealth in 1970. A number of non-reform states also reduced their wealth-related disparities.

Thus, the reform states seem to have targeted on reducing wealth-related disparities; and they succeeded in achieving some reductions, although in most of the reform states, as in the rest of the nation, wealthy districts were still able to spend considerably more than low-wealth places. The 20 states showed less progress in reducing overall disparities than might be expected of a reform movement; but it is clear that reform efforts have been swimming against a national current of increasing disparities.

The Costs of Further Equalization

If the education system is to reduce disparities in the core program in the future, a decision must be made as to the extent of disparity that can be tolerated. As in most policy decisions, this one entails consideration of principles and practical constraints. Too loose a criterion might violate principles of equal educational opportunity; a very strict criterion could call for funds that might, in practice, not be made available. The costs of equalizing in 1975 so that each state met the Office of Education disparity test would have been $5.4 billion. This is a substantial amount; but unless action is taken toward more effective reform, the amounts in the future will become greater -- not only because of inflation, but also because of an apparent trend toward increasing disparity in America's schools.

NOTES

1. The files used for the two years were formed by combining data from several sources. School data were collected as part of the ELSEGIS (Elementary and Secondary General Information System) series by the National Center for Education Statistics. These files contain breakdowns of revenue by source, expenditures by purpose, as well as average daily membership and attendance. In addition, the 1970 survey contains data on staff by job classification and education level. Demographic data on population (racial, sex, and age breakdowns; income; tenancy; occupation; and education) from the 1970 Census of Population have been added to the 1970 ELSEGIS SDEL3 (School District Data -- ELSEGIS III) tapes. These tapes and documentation are available through NCES. To this file was added 1970 property valuation data from a special survey conducted under the auspices of the Office of Assistant Secretary for Planning and Evaluation of DHEW.

   A similar file was created for 1975. Demographic data from the 1970 Census Fifth Count was remapped to 1973-74 school district boundaries and merged with the ELSEGIS data. Property valuation from 1974 survey of school districts were added to this file.

   The final files contained data from 4,556 districts in 1970 and 5,770 districts in 1975. Property valuation data are available for every state except Alabama and Louisiana in 1970 and Alaska and Hawaii in both years.

2. Enrollment is reported in different ways across the states. Some use average daily attendance (ADA), some use average daily membership (ADM), and some use a combination. The choice of pupil-counting method can make a difference; in particular, districts with high absentee rates would generally suffer in the allocation of state funds if the state used ADA. We are not in a position to judge one or another method as preferable; therefore this study adopts whatever measure the state has used.

3. This problem has been the subject of several recent investigations. For studies of cost-of-education indexes in individual states, see Selected Papers in School Finance, 1974 and 1975 editions (Office of Education). Alternatives Cost-of-Education Indices, (Killalea Associates, October 1977, prepared for the National Institute of Education) assesses a number of index formulations, including two described in A Cost-of-Education Index: Methodological Considerations (Killalea Associates, prepared for the National Center for Education Statistics, October 1977).

4. This kind of result might be thought to support the view that states operating many districts could improve their equity status through district consolidation. Whether or not their status would improve depends on the measure of equity, as has often been pointed out (see, for example, Inequality in California School Finance, Rand Corporation, March, 1975). Moreover, it could raise new questions about the unit of observation; for very large districts, equity considerations might involve intradistrict disparities, which are not analyzed here.

5. The requirement is specified in 45 CFR 115.63. States have also set their own requirements. The California Supreme Court has required that, after a period of years of phased-in reform, the state's system should exhibit a disparity no greater than $100 per pupil from place to place. California's expenditures (defined in this study as state, local, and federal impact aid) averaged $1,095 per pupil in 1975, and accordingly the court criterion is even more limiting than that set by the Office of Education.

6. Students are grouped into quartiles according to their districts' property valuation per pupil: the fourth of a state's students that are in districts with the lowest valuation per pupil, the fourth that are in districts with the highest, and the two middle quartiles (combined into one group for ease of presentation). As can be expected, some districts (particularly very large ones) have students in two quartiles. In such cases, a district's students are all "tagged" with the same property valuation and then distributed across the quartiles; and they are also tagged with the district's average expenditures per pupil. It is then possible to compute the (pupil-weighted) average expenditures in the quartiles, which are expressed as a percentage of the state's average expenditures.

7. The reader should keep in mind that the wealth-related disparity ratio can be expected to be lower than the 95:5 disparity ratio, because the latter assesses disparity across 90 percent of the students. If a 95:5 ratio had been calculated for students ordered by local wealth, the disparity ratios would have been much higher than those presented in Table IV (but would still be lower than the 95:5 ratio of overall disparity).

8. See National Conference of State Legislatures, School Finance Reform: Legislator's Handbook, and Education Commission of the States, School Finance Reform in the States, 1976-77.

Appendix A

Appropriate Resource Levels in Non-Unified Districts

In states that operate non-unified school districts, per-pupil expenditures are generally lower in elementary districts than in secondary districts. The difference is generally considered justified by the need for advanced courses or smaller classes in high schools. An analysis that takes no account of these justifiable spending differences can over- or underestimate the extent of disparity or the incidence of disparity in districts of varying wealth. If an elementary district spends $400 per pupil (and is low in local wealth) and a secondary district spends $1,600 per pupil (and is high in local wealth), the calculated disparity of 4.00 is greater by some amount than the "true" disparity. On the other hand, a high-wealth elementary district may spend $1,200 per pupil, while a low-wealth secondary district may spend only $1,000; the calculated disparity of 1.20 understates the real disparity. And, of course, in neither instance are the expenditures in non-unified districts really comparable with those in unified districts.

The obviously correct resolution is to associate each elementary district with the secondary district to which it sends its students after the last year of elementary schooling. Then, under the reasonable assumption that parents would not discriminate against their younger children in favor of their older children, the total expenditure in the two districts divided by the total number of children in both districts produces a figure that can validly be compared with the resource level in unified districts. (This approach should also be extended to estimate the local wealth backing the children in the two kinds of districts. This extension is complicated by the fact that most secondary districts draw from several elementary districts, and the elementary districts may vary widely in their property wealth.) Unfortunately, the data required for the association of districts are not available.

An alternative approach that could be satisfactory for a study of this kind is to adjust the expenditures as reported for non-unified districts -- upward for elementary and downward for secondary. There is no agreed standard for such an adjustment factor, but we can inspect the decisions made by a number of states that have explicitly addressed this matter in their school finance programs. Table A-1 lists the weightings in 11 states that either operate non-unified districts or that use pupil weightings in the district allocations. Most of the states give extra weightings for secondary pupils, ranging from 8 percent to 36 percent more than for elementary grades. The best-known exception is Florida; legislators in this state recently determined that the tender years were more important for education than many have believed in the past, and accordingly have given greater weight to elementary grades. Even this is not a clear direction, since Florida's weighting of 0.97 for secondary versus 1.0 for elementary is calculated without taking into account the vocational education program that Florida operates.

Based on the weightings in Table A-1, 20 percent appears to be a reasonably acceptable figure for use in an adjustment. Two sets of computations were made for comparison purposes. One set made no adjustment at all. In another set, an adjustment was made as follows. It was assumed that secondary districts were justifiably alloted 20 percent more

Table A-1. Elementary-Secondary Expenditure Weightings, Selected States

Delaware	1.184[a]
Florida	0.974[b]
Illinois	1.250[a]
Kentucky	1.125[a]
Louisiana	1.080[a]
Minnesota	1.286[a]
New Mexico	1.240[a]
New York	1.184[a]
North Dakota	1.247[a]
Oregon	1.300[a]
Pennsylvania	1.360[a]

[a]Calculated from data on school finance program in each state, as described in Public School Finance Programs, Office of Education, 1976.

[b]Calculated as in a; but the calculation does not include expenditures for vocational education programs.

than elementary districts, per pupil served. In order to have both types of non-unified districts comparable with unified districts, it is necessary to adjust both elementary and secondary districts. According to the Digest of Education Statistics, 1975, approximately 71 percent of the total student population is in elementary grades. Taking these factors into account, the adjustment was implemented by multiplying expenditures of elementary districts by 1.058 and expenditures of secondary districts by 0.882.

Table A-2 shows the computed 95:5 disparity measure for 1970, with and without the adjustment. There is surprisingly little difference between the two sets of calculations. In 39 states, the two results are identical; some but not all of these operate only unified districts. Only in three states -- Illinois, Massachusetts, and Montana -- do the two results differ substantially. In Montana, the difference is particularly striking: 1.59 with the adjustment and 1.91 without.

We conclude that for the purposes of the present study it is not necessary to adjust for different spending levels of non-unified districts. The matter is, however, an important one at the state level. It is obviously necessary to make such adjustments both to derive an appropriate allocation of state aid and to permit more precise measurements of disparity.

Table A-2. Disparities (by 95:5 Measure) in 1970, With and Without Adjustment for Elementary and Secondary Spending Differences

	Adjusted	Not Adjusted
Alabama	1.43	1.43
Alaska	1.30	1.30
Arizona	1.89	1.88
Arkansas	1.96	1.96
California	1.84	1.86
Colorado	1.76	1.76
Connecticut	2.20	2.21
Delaware	2.06	2.06
Florida	1.53	1.53
Georgia	1.86	1.86
Hawaii	1.00	1.00
Idaho	1.49	1.49
Illinois	1.91	2.05
Indiana	1.59	1.59
Iowa	1.82	1.82
Kansas	1.86	1.86
Kentucky	1.72	1.72
Louisiana	1.33	1.33
Maine	1.57	1.57
Maryland	1.60	1.60
Massachusetts	1.74	1.94
Michigan	1.81	1.81
Minnesota	1.46	1.46
Mississippi	1.71	1.71
Missouri	1.84	1.84
Montana	1.59	1.91
Nebraska	1.63	1.63
Nevada	1.19	1.19
N. Hampshire	1.89	1.88
New Jersey	1.89	1.93
New Mexico	1.51	1.51
New York	1.63	1.64
N. Carolina	1.49	1.49
N. Dakota	1.95	1.95
Ohio	1.78	1.78
Oklahoma	1.67	1.67
Oregon	1.48	1.50
Pennsylvania	1.57	1.57
R. Island	1.75	1.75
S. Carolina	1.66	1.66
S. Dakota	1.71	1.71
Tennessee	1.91	1.91
Texas	1.91	1.91
Utah	1.27	1.27
Vermont	3.30	3.36
Virginia	1.66	1.66
Washington	1.66	1.66
W. Virginia	1.49	1.49
Wisconsin	1.60	1.60
Wyoming	1.57	1.57

Appendix B

Alternative Measures of Disparity

A number of measures of disparity are available for use in studies such as the present one, and it is necessary to select among them. Of course, if one measure has properties that are peculiarly well suited to the analysis -- that is, the kind of disparity that is of most interest is better captured by one measure than by another -- then this value judgment will direct the choice. If several measures seem equally applicable to the situation to be analyzed, it is important to know how their results differ. To the extent that they differ, it may be necessary to accompany all interpretations of results with the proviso that they are subject to this uncertainty.

Of the measures in common use, none stands out as distinctly preferable for analysis of disparity. The next step is therefore to determine how results differ for different measures. Three common statistical measures -- the coefficient of deviation, the coefficient of variation, and the so-called Gini index -- were applied to estimate disparities. The three are differently defined and constructed, but all consider the entire distribution. In addition, disparities were also estimated by using the 95:5 ratio, because it is incorporated into federal regulation; its obvious drawback is that it considers only two points in the distribution.

Tables B-1 and B2 show the results of applying these four measures to national data bases (excluding Hawaii) for 1970 and 1975, respectively. The quantity under study is the state and local portion of current operating expenditures as defined in this study. A quick review of the tables indicates that the measures are strongly in agreement. It is difficult to discern how strongly, because each measure is presented differently (for instance, the Gini index is typically one half the value of the coefficient of variation). To tie down this estimate, the correlation coefficients between each pair of measures are shown below, based on Table B-2.

	95:5 Ratio	Coeff. Dev.	Coeff. Var.	Gini Index
95:5 Ratio	1	.83	.85	.89
Coefficient of Deviation		1	.95	.98
Coefficient of Variation			1	.97
Gini Index				1

The three statistical measures are virtually identical, with correlations ranging from .95 to .98. Even the 95:5 ratio has a high correlation with the statistical measures. We conclude that for the purposes of this study (and for many others as well) any one of the statistical measures is acceptable and, moreover, that even the 95:5 ratio, if one wished to use it because of its simplicity, would not introduce unacceptable uncertainties.

Table B-1. Within-State Disparities for Four Measures, 1970

	95:5 Percentile	Coefficient of Deviation	Coefficient of Variation	Gini Index
Alabama	1.43	0.09	0.12	0.07
Alaska	1.30	0.05	0.08	0.04
Arizona	1.88	0.17	0.21	0.12
Arkansas	1.96	0.14	0.18	0.10
California	1.86	0.15	0.21	0.11
Colorado	1.76	0.13	0.16	0.09
Connecticut	2.22	0.18	0.23	0.12
Delaware	2.06	0.12	0.16	0.09
Florida	1.53	0.11	0.13	0.07
Georgia	1.86	0.15	0.20	0.10
Hawaii	1.00	0.00	0.00	0.00
Idaho	1.49	0.09	0.12	0.07
Illinois	2.05	0.18	0.23	0.12
Indiana	1.59	0.11	0.14	0.08
Iowa	1.82	0.13	0.18	0.09
Kansas	1.86	0.13	0.22	0.10
Kentucky	1.72	0.15	0.17	0.10
Louisiana	1.33	0.08	0.09	0.05
Maine	1.57	0.12	0.16	0.09
Maryland	1.60	0.10	0.14	0.07
Massachusetts	1.94	0.15	0.19	0.10
Michigan	1.81	0.14	0.19	0.10
Minnesota	1.46	0.10	0.13	0.07
Mississippi	1.71	0.14	0.17	0.09
Missouri	1.84	0.16	0.25	0.11
Montana	1.91	0.16	0.19	0.11
Nebraska	1.63	0.09	0.15	0.07
Nevada	1.19	0.06	0.08	0.03
New Hampshire	1.88	0.12	0.17	0.09
New Jersey	1.93	0.15	0.20	0.11
New Mexico	1.51	0.09	0.14	0.07
New York	1.64	0.13	0.16	0.09
North Carolina	1.49	0.09	0.12	0.07
North Dakota	1.95	0.13	0.17	0.09
Ohio	1.78	0.16	0.19	0.11
Oklahoma	1.67	0.15	0.20	0.11
Oregon	1.50	0.09	0.12	0.06
Pennsylvania	1.57	0.13	0.16	0.09
Rhode Island	1.75	0.15	0.19	0.10
South Carolina	1.66	0.11	0.13	0.08
South Dakota	1.71	0.11	0.18	0.08
Tennessee	1.91	0.21	0.23	0.13
Texas	1.91	0.15	0.23	0.11
Utah	1.27	0.06	0.09	0.04
Vermont	3.36	0.26	0.38	0.19
Virginia	1.66	0.17	0.22	0.11
Washington	1.66	0.14	0.17	0.10
West Virginia	1.49	0.11	0.14	0.08
Wisconsin	1.60	0.11	0.16	0.08
Wyoming	1.57	0.13	0.17	0.09

Table B-2. Within-State Disparities for Four Measures, 1975

	95:5 Percentile	Coefficient of Deviation	Coefficient of Variation	Gini Index
Alabama	1.43	0.10	0.12	0.07
Alaska	1.29	0.11	0.16	0.07
Arizona	1.71	0.13	0.17	0.09
Arizona	1.78	0.14	0.18	0.10
California	2.02	0.15	0.21	0.11
Colorado	1.77	0.13	0.18	0.10
Connecticut	2.29	0.16	0.21	0.12
Delaware	1.70	0.14	0.18	0.09
Florida	1.30	0.07	0.09	0.05
Georgia	2.41	0.21	0.28	0.15
Hawaii	1.00	0.00	0.00	0.00
Idaho	1.51	0.13	0.16	0.09
Illinois	1.90	0.18	0.22	0.12
Indiana	1.50	0.11	0.13	0.07
Iowa	1.34	0.07	0.09	0.05
Kansas	1.65	0.09	0.14	0.07
Kentucky	1.86	0.17	0.20	0.11
Louisiana	1.32	0.08	0.10	0.05
Maine	1.67	0.13	0.16	0.09
Maryland	1.77	0.15	0.20	0.10
Massachusetts	2.17	0.17	0.23	0.12
Michigan	1.71	0.12	0.17	0.09
Minnesota	1.62	0.11	0.15	0.08
Mississippi	1.80	0.14	0.17	0.09
Missouri	1.73	0.16	0.24	0.11
Montana	1.97	0.15	0.21	0.11
Nebraska	1.73	0.12	0.19	0.09
Nevada	1.18	0.04	0.07	0.03
New Hampshire	1.78	0.12	0.16	0.09
New Jersey	1.95	0.16	0.20	0.11
New Mexico	1.41	0.08	0.13	0.06
New York	1.85	0.20	0.23	0.13
North Carolina	1.51	0.09	0.12	0.07
North Dakota	1.53	0.11	0.14	0.08
Ohio	1.78	0.16	0.20	0.11
Oklahoma	1.51	0.13	0.20	0.09
Oregon	1.50	1.11	0.14	0.08
Pennsylvania	1.57	0.14	0.17	0.09
Rhode Island	1.58	0.11	0.13	0.08
South Carolina	1.65	0.10	0.14	0.08
South Dakota	1.50	0.09	0.13	0.07
Tennessee	1.90	0.18	0.21	0.12
Texas	1.79	0.14	0.20	0.10
Utah	1.27	0.07	0.09	0.04
Vermont	1.99	0.18	0.21	0.12
Virginia	1.78	0.21	0.27	0.14
Washington	1.83	0.14	0.18	0.10
West Virginia	1.49	0.10	0.13	0.07
Wisconsin	1.59	0.12	0.16	0.09
Wyoming	1.82	0.15	0.21	0.10

Appendix C

Distribution of Impact Aid by Local Wealth

Table C-1 shows the distribution of federal impact aid by local wealth in the states for which data are available for 1975. (Property valuation data are missing in that year for Alaska and Hawaii; impact aid data could not be retrieved from the file for Texas.) Three groups are displayed: the 25 percent of the children in districts with lowest property valuation per pupil, the 25 percent in districts with highest EPV per pupil, and the middle 50 percent. The entries are the amounts of impact aid funds relative to the state average impact aid per pupil. Thus, the first entry can be read as: In Alabama, the children in the low-wealth districts received, on average, 1.14 of the state average impact aid funds, the middle 50 percent of the children received 1.26 of the state average, and the children in the high-wealth districts received 0.33 of the average.

Generally, low-wealth children and districts received high amounts of impact aid in 1975, relative to the state average. The sharpest exceptions are Connecticut, Kentucky, Maryland, Massachusetts, Mississippi, Oregon, Virginia, and West Virginia, in each of which the high-wealth children received much more than did the low-wealth children.

Table C-1. Distribution of Impact Aid by Local Wealth
(Impact Aid Per Pupil Relative to State Average)

	25% Low Wealth	50% Middle	25% High Wealth
Alabama	1.14	1.26	0.33
Arizona	2.14	0.80	0.27
Arkansas	1.33	1.12	0.42
California	1.31	0.97	0.75
Colorado	1.76	0.70	0.85
Connecticut	0.77	0.37	2.48
Delaware	3.81	0.06	0.07
Florida	2.15	0.68	0.48
Georgia	1.28	1.14	0.45
Idaho	1.84	0.78	0.60
Illinois	1.72	0.27	1.74
Indiana	2.51	0.59	0.31
Iowa	1.96	0.84	0.35
Kansas	2.24	0.74	0.26
Kentucky	0.14	1.29	1.29
Louisiana	2.63	0.36	0.65
Maine	1.61	1.08	0.23
Maryland	0.38	1.32	0.98
Massachusetts	0.99	0.87	1.27
Michigan	1.84	0.84	0.48
Minnesota	1.41	0.90	0.80
Mississippi	0.24	1.16	1.45
Missouri	2.25	0.56	0.63
Montana	1.36	1.04	0.55
Nebraska	2.98	0.38	0.25
Nevada	1.55	0.95	0.55
New Hampshire	0.32	1.40	0.68
New Jersey	1.89	0.95	0.21
New Mexico	2.03	0.61	0.75
New York	1.61	0.79	0.80
North Carolina	2.02	0.81	0.36
North Dakota	2.84	0.50	0.16
Ohio	1.89	0.63	0.84
Oklahoma	1.78	0.77	0.68
Oregon	0.70	0.51	2.27
Pennsylvania	0.47	1.52	0.48
Rhode Island	1.96	0.88	0.27
South Carolina	1.53	1.17	0.12
South Dakota	2.91	0.37	0.35
Indiana	1.29	0.85	1.02
Utah	1.65	0.73	0.90
Vermont	0.94	1.21	0.65
Virginia	0.60	0.74	1.93
Washington	2.06	0.55	0.85
West Virginia	0.27	1.37	0.99
Wisconsin	1.38	0.63	1.37
Wyoming	1.76	0.43	1.39